September 23, 2013

WELL WORK PERMIT
Horizontal 6A Well

This permit, API Well Number: 47-1706318, issued to ANTERO RESOURCES CORPORATION, is evidence of permission granted to perform the specified well work at the location described on the attached pages and located on the attached plat, subject to the provisions of Chapter 22 of the West Virginia Code of 1931, as amended, and all rules and regulations promulgated thereunder, and to all conditions and provisions outlined in the pages attached hereto. Notification shall be given by the operator to the Oil and Gas Inspector at least 24 hours prior to the construction of roads, locations, and/or pits for any permitted work. In addition, the well operator shall notify the same inspector 24 hours before any actual well work is commenced and prior to running and cementing casing. Spills or emergency discharges must be promptly reported by the operator to 1-800-642-3074 and to the Oil and Gas inspector.

Please be advised that form WR-35, Well Operators Report of Well Work is to be submitted to this office within 90 days completion of permitted well work, as should form WR-34 Discharge Monitoring Report within 30 days of discharge of pits, if applicable. Failure to abide by all statutory and regulatory provisions governing all duties and operations hereunder may result in suspension or revocation of this permit and, in addition, may result in civil and/or criminal penalties being imposed upon the operators.

In addition to the applicable requirements of this permit, and the statutes and rules governing oil and gas activity in WV, this permit may contain specific conditions which must be followed. Permit conditions are attached to this cover letter.

Per 35CSR-4-5.2.g this permit will expire in two (2) years from the issue date unless permitted well work is commenced. If there are any questions, please feel free to contact me at (304) 926-0499 ext. 1654.

James Martin
Chief

Operator's Well No: OLIVIA UNIT 2H
Farm Name: HAUG, ROBERT M. ET AL
API Well Number: 47-1706318
Permit Type: Horizontal 6A Well
Date Issued: 09/23/2013

Promoting a healthy environment.
PERMIT CONDITIONS

West Virginia Code § 22-6A-8(d) allows the Office of Oil and Gas to place specific conditions upon this permit. Permit conditions have the same effect as law. **Failure to adhere to the specified permit conditions may result in enforcement action.**

**CONDITIONS**

1. This proposed activity may require permit coverage from the United States Army Corps of Engineers (USACOE). Through this permit, you are hereby being advised to consult with USACOE regarding this proposed activity.

2. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code § 22-6A-5a (12), which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than fifty (50) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.

3. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the fill material shall be within plus or minus 2% of the optimum moisture content as determined by the standard proctor density test, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort. Each lift must meet 95% compaction of the optimum density based on results from the standard proctor density test of the actual soils used in specific engineered fill sites. Each lift shall be tested for compaction, with a minimum of two tests per lift per acre of fill. All test results shall be maintained on site and available for review.

4. Operator shall install signage per § 22-6A-8g (6) (B) at all source water locations included in their approved water management plan within 24 hours of water management plan activation.

5. Oil and gas water supply wells will be registered with the Office of Oil and Gas and all such wells will be constructed and plugged in accordance with the standards of the Bureau for Public Health set forth in its Legislative rule entitled *Water Well Regulations*, 64 C.S.R. 19. Operator is to contact the Bureau of Public Health regarding permit requirements. In lieu of plugging, the operator may transfer the well to the surface owner upon agreement of the parties. All drinking water wells within fifteen hundred feet of the water supply well shall be flow tested by the operator upon request of the drinking well owner prior to operating the water supply well.

6. Pursuant to the requirements pertaining to the sampling of domestic water supply wells/springs the operator shall, no later than thirty (30) days after receipt of analytical data provide a written copy to the Chief and any of the users who may have requested such analyses.

7. If any explosion or other accident causing loss of life or serious personal injury occurs in or about a well or well work on a well, the well operator or its contractor shall give notice, stating the particulars of the explosion or accident, to the oil and gas inspector and the Chief, within 24 hours of said accident.

8. During the casing and cementing process, in the event cement does not return to the surface, the oil and gas inspector shall be notified within 24 hours.
STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
WELL WORK PERMIT APPLICATION

1) Well Operator: Antero Resources Corporation 494488557
Operator ID
2) Operator’s Well Number: Olivia Unit 2H Well Pad Name: Nash Pad
3) Elevation, current ground: ~1395' Elevation, proposed post-construction: 138'
4) Well Type: (a) Gas  Oil  Underground Storage Other
(b) If Gas: Shallow  Deep  Horizontal
5) Existing Pad? Yes or No: No
6) Proposed Target Formation(s), Depth(s), Anticipated Thicknesses and Associated Pressure(s):
   Marcellus Shale: 7200' TVD, Anticipated Thickness: 55 Feet, Associated Pressure: 2960#/sq
7) Proposed Total Vertical Depth: 7200' TVD
8) Formation at Total Vertical Depth: Marcellus Shale
9) Proposed Total Measured Depth: 18,000' MD
10) Approximate Fresh Water Strata Depths: 198', 201'
11) Method to Determine Fresh Water Depth: Offset well records. Depths have been adjusted according to surface elevations.
12) Approximate Saltwater Depths: 897', 1760'
13) Approximate Coal Seam Depths: 663'
14) Approximate Depth to Possible Void (coal mine, karst, other): None anticipated
15) Does proposed well location contain coal seams directly overlying or adjacent to an active mine? If so, indicate name and depth of mine: No
16) Describe proposed well work: Drill, perforate, fracture a new horizontal shallow well and complete Marcellus Shale
17) Describe fracturing/stimulating methods in detail:
   Antero plans to pump slickwater into the Marcellus Shale formation in order to ready the well for production. The fluid will be comprised of approximately 99 percent water and sand, with less than 1 percent special-purpose additives as shown in the attached "List of Anticipated Additives Used for Fracturing or Stimulating Well."
18) Total area to be disturbed, including roads, stockpile area, pits, etc. (acres): 22.84 acres
19) Area to be disturbed for well pad only, less access road (acres): 5.25 acres

Received AUG 16 2013
Office of Oil and Gas
WEST VIRGINIA DEPT. OF ENVIRONMENTAL PROTECTION
09/27/2013
## CASING AND TUBING PROGRAM

<table>
<thead>
<tr>
<th>TYPE</th>
<th>Size</th>
<th>New or Used</th>
<th>Grade</th>
<th>Weight per ft.</th>
<th>FOOTAGE: For Drilling</th>
<th>INTERVALS: Left in Well</th>
<th>CEMENT: Fill-up (Cu. Ft.)</th>
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<tbody>
<tr>
<td>Conductor</td>
<td>20&quot;</td>
<td>New</td>
<td>H-40</td>
<td>94#</td>
<td>40'</td>
<td>40'</td>
<td>CTS, 38 Cu. Ft.</td>
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<tr>
<td>Fresh Water</td>
<td>13-3/8&quot;</td>
<td>New</td>
<td>J-55/H-40</td>
<td>54.5#/ 48#</td>
<td>300'</td>
<td>300'</td>
<td>CTS, 417 Cu. Ft.</td>
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<tr>
<td>Coal</td>
<td>9-5/8&quot;</td>
<td>New</td>
<td>J-55</td>
<td>36#</td>
<td>2470'</td>
<td>2470'</td>
<td>CTS, 1006 Cu. Ft.</td>
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<td>Intermediate</td>
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<tr>
<td>Production</td>
<td>5-1/2&quot;</td>
<td>New</td>
<td>P-110</td>
<td>20#</td>
<td>16000'</td>
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<td>4001 Cu. Ft.</td>
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<td>N-80</td>
<td>4.7#</td>
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## TYPE

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<th>TYPE</th>
<th>Size</th>
<th>Wellbore Diameter</th>
<th>Wall Thickness</th>
<th>Burst Pressure</th>
<th>Cement Type</th>
<th>Cement Yield</th>
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<tr>
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<td>20&quot;</td>
<td>24&quot;</td>
<td>0.438&quot;</td>
<td>1530</td>
<td>Class A</td>
<td>1.18</td>
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<td>13-3/8&quot;</td>
<td>17-1/2&quot;</td>
<td>0.38&quot;/0.33&quot;</td>
<td>2730/1730</td>
<td>Class A</td>
<td>1.18</td>
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<td>12-1/4&quot;</td>
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<tr>
<td>Production</td>
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<td>8-3/4&quot; &amp; 8-1/2&quot;</td>
<td>0.361&quot;</td>
<td>12630</td>
<td>Lead H/POZ &amp; Tail - H</td>
<td>H/POZ-1.44 &amp; H-1.8</td>
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## PACKERS

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</tr>
<tr>
<td>Depths Set:</td>
<td>N/A</td>
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</tbody>
</table>
21) Describe centralizer placement for each casing string.  
Conductor: no centralizers  
Surface Casing: one centralizer 10' above the float shoe, one on the insert float collar and one every 4th joint spaced up the hole to surface.  
Intermediate Casing: one centralizer above float joint, one centralizer 5' above float collar and one every 4th collar to surface.  
Production Casing: one centralizer at shoe joint and one every 3 joints to top of cement in intermediate casing.  

22) Describe all cement additives associated with each cement type.  
Conductor: no additives, Class A cement.  
Surface: Class A cement with 2% calcium and 1/4 lb flake, 5 gallons of clay treat  
Intermediate: Class A cement with 1/4 lb of flake, 5 gallons of clay treat  
Production: Lead cement- 50/50 Class H/Poz + 1.5% salt + 1% C-45 + 0.5% C-16a + 0.2% C-12 + 0.45% C-20 + 0.05% C-51  
Production: Tail cement- Class H + 45 PPS Calcium Carbonate + 1.0% FL-160 + 0.2% ACGB-47 + 0.05% ACSA-51 + 0.2% ACR-20  

23) Proposed borehole conditioning procedures.  
Conductor: blowhole clean with air, run casing, 10 bbls fresh water.  
Surface: blowhole clean with air, trip to conductor shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate pipe capacity + 40 bbls fresh water followed by 25 bbls bentonite mud, 10 bbls fresh water spacer.  
Intermediate: blowhole clean with air, trip to surface casing shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate 40 bbls brine water followed by 10 bbls fresh water and 25 bbls bentonite mud, pump 10 bbls fresh water.  
Production: circulate with 14 lb/gal NaCl mud, trip to middle of lateral, circulate, pump high viscosity sweep, trip to base of curve, pump high viscosity sweep, trip to top of curve, trip to bottom, circulate, pump high viscosity sweep, trip out, run casing, circulate 10 bbls fresh water, pump 48 bbls barite pill, pump 10 bbls fresh water followed by 48 bbls mud flush and 10 bbls water.  

*Note: Attach additional sheets as needed.
STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name: Antero Resources Corporation
OP Code: 484488557

Watershed (HUC 10): Nutter Fork
Quadrangle: Smithburg 7.5'
Elevation: 1381'
County: Doddridge
District: West Union

Do you anticipate using more than 5,000 bbls of water to complete the proposed well work? Yes X No
Will a pit be used for drill cuttings? Yes No X
If so, please describe anticipated pit waste: No pit will be used at this site (Drilling and Flowback Fluids will be stored in tanks. Cuttings will be tanked and hauled offsite.)
Will a synthetic liner be used in the pit? Yes N/A No N/A If so, what ml.? N/A

Proposed Disposal Method For Treated Pit Wastes:
- Land Application
- Underground Injection (UIC Permit Number)
- Reuse (at API Number Future permitted well locations when applicable. API# will be provided on Form WR-34)
- Off Site Disposal (Meadowfill Landfill Permit #SWF-1032-98)
- Other (Explain)

Will closed loop system be used? Yes

Drilling medium anticipated for this well? Air, freshwater, oil based, etc.
- If oil based, what type? Synthetic, petroleum, etc. N/A

Additives to be used in drilling medium? Please See Attachment

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc.
- Stored in tanks, removed offsite and taken to landfill.
- If left in pit and plan to solidify what medium will be used? (cement, lime, sawdust) N/A
- Landfill or offsite name/permit number? Meadowfill Landfill (Permit #SWF-1032-98)

I certify that I understand and agree to the terms and conditions of the GENERAL WATER POLLUTION PERMIT issued on August 1, 2005, by the Office of Oil and Gas of the West Virginia Department of Environmental Protection. I understand that the provisions of the permit are enforceable by law. Violations of any term or condition of the general permit and/or other applicable law or regulation can lead to enforcement action.

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this application form and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment.

Company Official Signature: [Signature]
Company Official (Typed Name): Gerard S. Alberts
Company Official Title: Environmental & Regulatory Manager

Subscribed and sworn before me this 3 day of July 2013
Y. Bottinelli
Notary Public
State of Colorado
Notary ID 201240727365
My Commission Expires 11/9/2016

09/27/2013
Form WW-9

Antero Resources Corporation

Operator's Well No. OliviaUnit 2H

Proposed Revegetation Treatment: Acres Disturbed 22.84 Prevegetation pH

Lime 2-3 Tons/acre or to correct to pH 6.5

Fertilizer (10-20-20 or equivalent) 500 lbs/acre (500 lbs minimum)

Mulch 2-3 Tons/acre

Road "A" (4.58) + Well Pad (5.25) + Production Equipment Pad (1.13) + Excess/Topsoil Material Stockpiles (11.88) = 22.84 Acres

Seed Type

Annual Ryegrass 40

*See attached Table 3 for additional seed type (Nash Pad Design Page 16)

Area I (Temporary)

*or type of grass seed requested by surface owner

Tall Fescue 30

*See attached Table 3 for additional seed type (Nash Pad Design Page 16)

Area II (Permanent)

*or type of grass seed requested by surface owner

Attach:

Drawing(s) of road, location, pit and proposed area for land application.

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: Douglas Newton

Comments: Present + Mulch install ERS to WV Dep

regulations

Title: Office of Oil and Gas Environmental Protection

Field Reviewed? ( ) Yes (________) No

RECEIVED

Office of Oil and Gas

AUG 16 2013

WV Department of Environmental Protection

09/27/2013
Form WW-9 Additives Attachment

SURFACE INTERVAL

1. Fresh Water
2. Soap –Foamer AC
3. Air

INTERMEDIATE INTERVAL

STIFF FOAM RECIPE:

1) 1 ppb Soda Ash / Sodium Carbonate-Alkalinity Control Agent
2) 1 ppb Conqor 404 (11.76 ppg) / Corrosion Inhibitor
3) 4 ppb KLA-Gard (9.17 ppg) / Amine Acid Complex-Shale Stabilizer
4) 1ppb Mil Pac R / Sodium Carboxymethylcellulose-Filtration Control Agent
5) 12 ppb KCL / Potassium Chloride-inorganic Salt
6) Fresh Water 80 bbls
7) Air

PRODUCTION INTERVAL

1. Alpha 1655
   Salt Inhibitor
2. Mil-Carb
   Calcium Carbonate
3. Cottonseed Hulls
   Cellulose-Cottonseed Pellets – LCM
4. Mil-Seal
   Vegetable, Cotton & Cellulose-Based Fiber Blend – LCM
5. Clay-Trol
   Amine Acid Complex – Shale Stabilizer
6. Xan-Plex
   Viscosifier For Water Based Muds
7. Mil-Pac (All Grades)
   Sodium Carboxymethylcellulose – Filtration Control Agent
8. New Drill
   Anionic Polyacrylamide Copolymer Emulsion – Shale Stabilizer
9. Caustic Soda
   Sodium Hydroxide – Alkalinity Control
10. Mil-Lime
    Calcium Hydroxide – Lime
11. LD-9
    Polyether Polyol – Drilling Fluid Defoamer
12. Mil Mica
    Hydro-Biotite Mica – LCM
13. Escaid 110
               Drilling Fluid Solvent – Aliphatic Hydrocarbon
14. Ligco
               Highly Oxidized Leonardite – Filtration Control Agent
15. Super Sweep
               Polypropylene – Hole Cleaning Agent
16. Sulfatrol K
               Drilling Fluid Additive – Sulfonated Asphalt Residuum
17. Sodium Chloride, Anhydrous
               Inorganic Salt
18. D-D
               Drilling Detergent – Surfactant
19. Terra-Rate
               Organic Surfactant Blend
20. W.O. Defoam
               Alcohol-Based Defoamer
21. Perma-Lose HT
               Fluid Loss Reducer For Water-Based Muds
22. Xan-Plex D
               Polysaccharide Polymer – Drilling Fluid Viscosifier
23. Walnut Shells
               Ground Cellulosic Material – Ground Walnut Shells – LCM
24. Mil-Graphite
               Natural Graphite – LCM
25. Mil Bar
               Barite – Weighting Agent
26. X-Cide 102
               Biocide
27. Soda Ash
               Sodium Carbonate – Alkalinity Control Agent
28. Clay Trol
               Amine Acid complex – Shale Stabilizer
29. Sulfatrol
               Sulfonated Asphalt – Shale Control Additive
30. Xanvis
               Viscosifier For Water-Based Muds
31. Milstarch
               Starch – Fluid Loss Reducer For Water Based Muds
32. Mil-Lube
               Drilling Fluid Lubricant
Important:
For each proposed primary water source (including source intakes for purchased water sources) identified in your water management plan, and summarized herein, DEP has made an evaluation concerning water availability over the specified date range. DEP’s assessment is based on the following considerations:

• Statistical analysis of historical USGS stream gauge data (transferred to un-gauged locations as necessary);
• Identification of sensitive aquatic life (endangered species, mussels, etc.);
• Quantification of known existing demands on the water supply (Large Quantity Users);
• Minimum flows required by the Army Corps of Engineers; and
• Designated stream uses.

Based on these factors, DEP has provided, for each intake location (and origination point for purchased water), a reference gauge location and discharge flow reading which must be surpassed prior to withdrawals. Additionally, DEP has established a minimum passby flow at the withdrawal location which must also be surpassed prior to withdrawals. These thresholds are considered terms of the permit and are enforceable as such.

DEP is aware that some intake points will be used for multiple wells and well sites. In these cases, the thresholds set by the Water Management Plan are to be interpreted as total withdrawal limits for each location over the specified date range regardless of how many wells are supported by that intake.

For all purchased water intakes, determinations of water availability are made at the original source intake location. It is the responsibility of the Oil and Gas Operator, not the seller, to cease withdrawal of water from the seller when flows are less than the minimum gauge reading at the stream gauge referenced by the Water Management Plan in order to protect stream uses.

Note that the determinations made herein are based on the best available data, but it is impossible to predict water availability in the future. While the DEP has carefully established these minimum withdrawal thresholds, it remains the operator’s responsibility to protect aquatic life at all times. Approval to withdrawal is contingent upon permission from the land owner. It is the responsibility of the operator to secure and maintain permission prior to any withdrawals.

The operator is reminded that 24-48 hours prior to withdrawing (or purchasing) water, DEP must be notified by email at DEP.water.use@wv.gov.
Source Summary

WMP: 01413
API Number: 047-017-06318
Operator: Antero Resources
Olivia Unit 2H

Stream/River

- **Source**: Ohio River @ Ben's Run Withdrawal Site
  - Tyler
  - Owner: Ben's Run Land Company
  - Limited Partnership
  - Intake Latitude: 39.46593
  - Intake Longitude: -81.110781
  - Start Date: 1/13/2014
  - End Date: 1/13/2015
  - Total Volume (gal): 7,570,000
  - Max. daily purchase (gal):
  - Regulated Stream? Yes
  - Ohio River Min. Flow: 9999999
  - Ref. Gauge ID: 9999999
  - Ohio River Station: Willow Island Lock & Dam
  - Max. Pump rate (gpm): 3,360
  - Min. Gauge Reading (cfs): 6,468.00
  - Min. Passby (cfs):
  - DEP Comments: Refer to the specified station on the National Weather Service’s Ohio River forecast website: http://www.erh.noaa.gov/ohrfc//flows.shtml

- **Source**: West Fork River @ JCP Withdrawal
  - Harrison
  - Owner: James & Brenda Raines
  - Intake Latitude: 39.320913
  - Intake Longitude: -80.337572
  - Start Date: 1/13/2014
  - End Date: 1/13/2015
  - Total Volume (gal): 7,570,000
  - Max. daily purchase (gal):
  - Regulated Stream? Yes
  - Stonewall Jackson Dam
  - Ref. Gauge ID: 3061000
  - West Fork River at Enterprise, WV
  - Max. Pump rate (gpm): 2,000
  - Min. Gauge Reading (cfs): 175.00
  - Min. Passby (cfs): 146.25
  - DEP Comments:

- **Source**: West Fork River @ McDonald Withdrawal
  - Harrison
  - Owner: David Shrieffes
  - Intake Latitude: 39.16761
  - Intake Longitude: -80.45069
  - Start Date: 1/13/2014
  - End Date: 1/13/2015
  - Total Volume (gal): 7,570,000
  - Max. daily purchase (gal):
  - Regulated Stream? Yes
  - Stonewall Jackson Dam
  - Ref. Gauge ID: 3061000
  - West Fork River at Enterprise, WV
  - Max. Pump rate (gpm): 3,000
  - Min. Gauge Reading (cfs): 175.00
  - Min. Passby (cfs): 106.30
  - DEP Comments:
### West Fork River @ GAL Withdrawal

- **Source**: West Fork River @ GAL Withdrawal
- **Start Date**: 1/13/2014
- **End Date**: 1/13/2015
- **Total Volume (gal)**: 7,570,000
- **Max. daily purchase (gal)**: 2,000
- **Intake Latitude**: 39.16422
- **Intake Longitude**: -80.45173
- **Regulated Stream?**: Yes
- **Stonewall Jackson Dam**: Ref. Gauge ID: 3061000
- **WEST FORK RIVER AT ENTERPRISE, WV**
- **Max. Pump rate (gpm)**: 2,000
- **Min. Gauge Reading (cfs)**: 175.00
- **Min. Passby (cfs)**: 106.30

### Middle Island Creek @ Mees Withdrawal Site

- **Source**: Middle Island Creek @ Mees Withdrawal Site
- **Start Date**: 1/13/2014
- **End Date**: 1/13/2015
- **Total Volume (gal)**: 7,570,000
- **Max. daily purchase (gal)**: 3,360
- **Intake Latitude**: 39.43113
- **Intake Longitude**: -81.079567
- **Regulated Stream?**: No
- **Ref. Gauge ID**: 3114500
- **MIDDLE ISLAND CREEK AT LITTLE, WV**
- **Max. Pump rate (gpm)**: 3,360
- **Min. Gauge Reading (cfs)**: 52.59
- **Min. Passby (cfs)**: 47.63

### Middle Island Creek @ Dawson Withdrawal

- **Source**: Middle Island Creek @ Dawson Withdrawal
- **Start Date**: 1/13/2014
- **End Date**: 1/13/2015
- **Total Volume (gal)**: 7,570,000
- **Max. daily purchase (gal)**: 3,000
- **Intake Latitude**: 39.379292
- **Intake Longitude**: -80.867803
- **Regulated Stream?**: No
- **Ref. Gauge ID**: 3114500
- **MIDDLE ISLAND CREEK AT LITTLE, WV**
- **Max. Pump rate (gpm)**: 3,000
- **Min. Gauge Reading (cfs)**: 76.03
- **Min. Passby (cfs)**: 28.83

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**DEP Comments:**
McElroy Creek @ Forest Withdrawal

- Owner: Forest C. & Brenda L. Moore
- Total Volume (gal): 7,570,000
- Max. daily purchase (gal): 3,130
- Intake Latitude: 39.39675
- Intake Longitude: -80.738197

Ref. Gauge ID: 3114500
MIDDLE ISLAND CREEK AT LITTLE, WV

Max. Pump rate (gpm): 1,000
Min. Gauge Reading (cfs): 74.77
Min. Passby (cfs): 13.10

DEP Comments:

Meathouse Fork @ Gagnon Withdrawal

- Owner: George L. Gagnon and Susan C. Gagnon
- Total Volume (gal): 7,570,000
- Max. daily purchase (gal): 3,130
- Intake Latitude: 39.26054
- Intake Longitude: -80.720998

Ref. Gauge ID: 3114500
MIDDLE ISLAND CREEK AT LITTLE, WV

Max. Pump rate (gpm): 1,000
Min. Gauge Reading (cfs): 71.96
Min. Passby (cfs): 11.74

DEP Comments:

Meathouse Fork @ Whitehair Withdrawal

- Owner: Elton Whitehair
- Total Volume (gal): 7,570,000
- Max. daily purchase (gal): 3,130
- Intake Latitude: 39.211317
- Intake Longitude: -80.679592

Ref. Gauge ID: 3114500
MIDDLE ISLAND CREEK AT LITTLE, WV

Max. Pump rate (gpm): 1,000
Min. Gauge Reading (cfs): 69.73
Min. Passby (cfs): 7.28

DEP Comments:
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<tr>
<th>Source</th>
<th>Tom's Fork @ Erwin Withdrawal</th>
<th>Owner: John F. Erwin and Sandra E. Erwin</th>
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<tr>
<td>Start Date</td>
<td>1/13/2014</td>
<td>End Date</td>
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<tr>
<td>Total Volume (gal)</td>
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<tr>
<td>Intake Latitude</td>
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<tr>
<td>Max. Pump rate (gpm)</td>
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<td>Min. Passby (cfs)</td>
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<table>
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<tr>
<th>Source</th>
<th>Arnold Creek @ Davis Withdrawal</th>
<th>Owner: Jonathon Davis</th>
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<tbody>
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<td>End Date</td>
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<td>Total Volume (gal)</td>
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<td>MIDDLE ISLAND CREEK AT LITTLE, WV</td>
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<tr>
<td>Max. Pump rate (gpm)</td>
<td>1,000</td>
<td>Min. Gauge Reading (cfs)</td>
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<td>Min. Passby (cfs)</td>
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<tr>
<th>Source</th>
<th>Buckeye Creek @ Powell Withdrawal</th>
<th>Owner: Dennis Powell</th>
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<tbody>
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<td>End Date</td>
</tr>
<tr>
<td>Total Volume (gal)</td>
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<td>Max. daily purchase (gal)</td>
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<td>MIDDLE ISLAND CREEK AT LITTLE, WV</td>
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<tr>
<td>Max. Pump rate (gpm)</td>
<td>1,000</td>
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<td>Min. Passby (cfs)</td>
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<td>Source</td>
<td>Start Date</td>
<td>End Date</td>
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<tr>
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<tr>
<td>South Fork of Hughes River @ Knight Withdrawal</td>
<td>1/13/2014</td>
<td>1/13/2015</td>
</tr>
<tr>
<td>North Fork of Hughes River @ Davis Withdrawal</td>
<td>1/13/2014</td>
<td>1/13/2015</td>
</tr>
</tbody>
</table>

- **Max. Pump rate (gpm):**
  - South Fork of Hughes River @ Knight Withdrawal: 3,000
  - North Fork of Hughes River @ Davis Withdrawal: 1,000

- **Min. Gauge Reading (cfs):**
  - South Fork of Hughes River @ Knight Withdrawal: 39.80
  - North Fork of Hughes River @ Davis Withdrawal: 35.23

- **Min. Passby (cfs):**
  - South Fork of Hughes River @ Knight Withdrawal: 1.95
  - North Fork of Hughes River @ Davis Withdrawal: 2.19

- **Regulated Stream?:**
  - South Fork of Hughes River @ Knight Withdrawal: No
  - North Fork of Hughes River @ Davis Withdrawal: No
### Purchased Water

**Source** | **Ohio River @ Select Energy** | **Owner:** | **Select Energy**
---|---|---|---
**Start Date** | **1/13/2014** | **Total Volume (gal)** | **7,570,000**
**End Date** | **1/13/2015** | **Max. daily purchase (gal)** | **500,000**
**Intake Latitude:** | | | **39.346473**
**Intake Longitude:** | | | **-81.338727**

**Regulated Stream?** | **Yes** | **Ohio River Min. Flow** | **Ref. Gauge ID:** | **9999998**
**Ohio River Station:** | | | **Racine Dam**

**Max. Pump rate (gpm):** | **1,680** | **Min. Gauge Reading (cfs):** | **7,216.00**
**Min. Passby (cfs):** | | | 

**DEP Comments:** Refer to the specified station on the National Weather Service's Ohio River forecast website: [http://www.erh.noaa.gov/ohrfc//flows.shtml](http://www.erh.noaa.gov/ohrfc//flows.shtml)

**Source** | **Middle Island Creek @ Solo Construction** | **Owner:** | **Solo Construction, LLC**
---|---|---|---
**Start Date** | **1/13/2014** | **Total Volume (gal)** | **7,570,000**
**End Date** | **1/13/2015** | **Max. daily purchase (gal)** | **1,000,000**
**Intake Latitude:** | | | **39.399094**
**Intake Longitude:** | | | **-81.185548**

**Regulated Stream?** | **Yes** | **Ohio River Min. Flow** | **Ref. Gauge ID:** | **9999999**
**Ohio River Station:** | | | **Willow Island Lock & Dam**

**Max. Pump rate (gpm):** | | **Min. Gauge Reading (cfs):** | **6,468.00**
**Min. Passby (cfs):** | | |

**DEP Comments:** Elevation analysis indicates that this location has the same elevation as Middle Island Creek's pour point into the Ohio River. As such, it is deemed that water flow at this location is heavily influenced by the Ohio River.

**Source** | **Claywood Park PSD** | **Owner:** | **Claywood Park PSD**
---|---|---|---
**Start Date** | **1/13/2014** | **Total Volume (gal)** | **7,570,000**
**End Date** | **1/13/2015** | **Max. daily purchase (gal)** | 
**Intake Latitude:** | | | 
**Intake Longitude:** | | | 

**Regulated Stream?** | **Yes** | **Ref. Gauge ID:** | **9999998**
**Ohio River Station:** | | | **Racine Dam**

**Max. Pump rate (gpm):** | | **Min. Gauge Reading (cfs):** | **7,216.00**
**Min. Passby (cfs):** | | |

**DEP Comments:** Elevation analysis indicates that this location has approximately the same elevation as Little Kanawha's pour point into the Ohio River. As such, it is deemed that water flow at this location is heavily influenced by the Ohio River.
<table>
<thead>
<tr>
<th>Start Date</th>
<th>End Date</th>
<th>Total Volume (gal)</th>
<th>Max. daily purchase (gal)</th>
<th>Intake Latitude</th>
<th>Intake Longitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/13/2014</td>
<td>1/13/2015</td>
<td>7,570,000</td>
<td>200,000</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

- **Regulated Stream?** Stonewall Jackson Dam  
  - **Ref. Gauge ID:** 3061000  
  - **WEST FORK RIVER AT ENTERPRISE, WV**

- **Max. Pump rate (gpm):**
- **Min. Gauge Reading (cfs):** 171.48
- **Min. Passby (cfs):**

**DEP Comments:**
**Source Detail**

**WMP:** 01413  
**API/ID Number:** 047-017-06318  
**Operator:** Antero Resources

**Source ID:** 24516  
**Source Name:** Ohio River @ Select Energy Select Energy

- **HUC-8 Code:** 5030201  
- **Drainage Area (sq. mi.):** 25000  
- **County:** Pleasants

- **Endangered Species?**  
- **Trout Stream?**  
- **Regulated Stream?**  
- **Proximate PSD?**  
- **Gauged Stream?**

- **Source Latitude:** 39.346473  
- **Source Longitude:** -81.338727

- **Anticipated withdrawal start date:** 1/13/2014  
- **Anticipated withdrawal end date:** 1/13/2015

- **Total Volume from Source (gal):** 7,570,000

- **Max. Pump rate (gpm):** 1,680

- **Max. Simultaneous Trucks:**

- **Max. Truck pump rate (gpm):**

**Reference Gaug:** 9999998  
**Ohio River Station: Racine Dam**

**Drainage Area (sq. mi.):** 25,000.00  
**Gauge Threshold (cfs):** 7216

---

**Water Availability Profile**

"Flow on this stream is regulated by the Army Corps of Engineers. Please adhere to the stated thresholds to maintain the minimum guaranteed flow requirements."

<table>
<thead>
<tr>
<th>Month</th>
<th>Median monthly flow (+ pump) (cfs)</th>
<th>Threshold Available water (cfs)</th>
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<td>2</td>
<td>54,858.00</td>
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<tr>
<td>3</td>
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<td>-</td>
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<tr>
<td>4</td>
<td>62,552.00</td>
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<tr>
<td>5</td>
<td>43,151.00</td>
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<tr>
<td>6</td>
<td>27,095.00</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>17,840.00</td>
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</tr>
<tr>
<td>8</td>
<td>14,941.00</td>
<td>-</td>
</tr>
<tr>
<td>9</td>
<td>14,272.00</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>17,283.00</td>
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<tr>
<td>11</td>
<td>29,325.00</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>46,050.00</td>
<td>-</td>
</tr>
</tbody>
</table>

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**Water Availability Assessment of Location**

- **Base Threshold (cfs):** -
- **Upstream Demand (cfs):** 0.00
- **Downstream Demand (cfs):** 0.00
- **Pump rate (cfs):** 3.74
- **Headwater Safety (cfs):** 0.00
- **Ungauged Stream Safety (cfs):** 0.00

- **Min. Gauge Reading (cfs):** -
- **Passby at Location (cfs):** -

---

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.
Flow on this stream is regulated by the Army Corps of Engineers. Please adhere to the stated thresholds to maintain the minimum guaranteed flow requirements.

"Threshold", as depicted in the chart above, is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.
Source ID: 24518  Source Name: Claywood Park PSD

HUC-8 Code: 5030203
Drainage Area (sq. mi.): 25000  County: Wood
Anticipated withdrawal start date: 1/13/2014
Anticipated withdrawal end date: 1/13/2015
Total Volume from Source (gal): 7,570,000

Mussel Stream?

Ref. Gaug
9999998  Ohio River Station: Racine Dam

Drainage Area (sq. mi.) 25,000.00

Max. Pump rate (gpm):
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm): 0

Gauge Threshold (cfs): 7216

Median monthly flow (cfs)
Threshold (+ pump)
Estimated Available water (cfs)

Month | Median monthly flow (cfs) | Threshold (+ pump) | Estimated Available water (cfs)
--- | --- | --- | ---
1 | 50,956.00 | - | -
2 | 54,858.00 | - | -
3 | 73,256.00 | - | -
4 | 62,552.00 | - | -
5 | 43,151.00 | - | -
6 | 27,095.00 | - | -
7 | 17,840.00 | - | -
8 | 14,941.00 | - | -
9 | 14,272.00 | - | -
10 | 17,283.00 | - | -
11 | 29,325.00 | - | -
12 | 46,050.00 | - | -

Water Availability Profile

Flow on this stream is regulated by the Army Corps of Engineers. Please adhere to the stated thresholds to maintain the minimum guaranteed flow requirements.

*Threshold*, as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Water Availability Assessment of Location

Base Threshold (cfs): -
Upstream Demand (cfs): 0.00
Downstream Demand (cfs): 0.00
Pump rate (cfs):
Headwater Safety (cfs): 0.00
Ungauged Stream Safety (cfs): 0.00
Min. Gauge Reading (cfs): -
Passby at Location (cfs): -

This page is part of the Water Availability Section of the West Virginia Department of Environmental Protection's Antero Resources seasonally high flow calculation summary report.
Source Detail

Source ID: 24519  Source Name: Sun Valley Public Service District
Sun Valley PSD

HUC-8 Code: 5020002  Drainage Area (sq. mi.): 391.85  County: Harrison

Endangered Species?  Mussel Stream?
Trout Stream?  Tier 3?
Regulated Stream?  Stonewall Jackson Dam
Proximate PSD?  Gauged Stream?

Source Latitude: -  Source Longitude: -

Anticipated withdrawal start date: 1/13/2014  Anticipated withdrawal end date: 1/13/2015
Total Volume from Source (gal): 7,570,000
Max. Pump rate (gpm):
Max. Simultaneous Trucks:
Max. Truck pump rate (gpm):

Reference Gaug
3061000  WEST FORK RIVER AT ENTERPRISE, WV
Drainage Area (sq. mi.) 759.00  Gauge Threshold (cfs): 234

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Water Availability Profile

Flow on this stream is regulated by the Army Corps of Engineers. Please adhere to the stated thresholds to maintain the minimum guaranteed flow requirements.

Water Availability Assessment of Location

Base Threshold (cfs): -
Upstream Demand (cfs):
Downstream Demand (cfs):
Pump rate (cfs):
Headwater Safety (cfs): 0.00
Ungauged Stream Safety (cfs): 0.00
Min. Gauge Reading (cfs): -
Passby at Location (cfs): -

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.
Source ID: 24502  Source Name: Ohio River @ Ben's Run Withdrawal Site
Ben's Run Land Company Limited Partnership

HUC-8 Code: 5030201  Drainage Area (sq. mi.): 25000  County: Tyler

Endangered Species?  Mussel Stream?  Trout Stream?  Tier 3?
Regulated Stream?  Ohio River Min. Flow  Proximate PSD?
Gauged Stream?

Source Latitude: 39.46593  Source Longitude: -81.110781

Anticipated withdrawal start date: 1/13/2014  Anticipated withdrawal end date: 1/13/2015
Total Volume from Source (gal): 7,570,000
Max. Pump rate (gpm): 3,360
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm): 0

Reference Gaug: 9999999  Ohio River Station: Willow Island Lock & Dam
Drainage Area (sq. mi.) 25,000.00  Gauge Threshold (cfs): 6468

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<tr>
<td>12</td>
<td>41,300.00</td>
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</table>

Water Availability Profile

Flow on this stream is regulated by the Army Corps of Engineers. Please adhere to the stated thresholds to maintain the minimum guaranteed flow requirements.

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.
### Source Detail

- **Source ID:** 24503
- **Source Name:** West Fork River @ JCP Withdrawal
- **Source ID:** 24503
- **Source Name:** James & Brenda Raines
- **HUC-8 Code:** 5020002
- **Drainage Area (sq. mi.):** 532.2
- **County:** Harrison
- **Anticipated withdrawal start date:** 1/13/2014
- **Anticipated withdrawal end date:** 1/13/2015
- **Total Volume from Source (gal):** 7,570,000
- **Max. Pump rate (gpm):** 2,000
- **Max. Simultaneous Trucks:** 0
- **Max. Truck pump rate (gpm):** 0

### Reference Gaug

- **Gauge:** WEST FORK RIVER AT ENTERPRISE, WV
- **Drainage Area (sq. mi.):** 759.00
- **Gauge Threshold (cfs):** 234

### Water Availability Profile

*Flow on this stream is regulated by the Army Corps of Engineers. Please adhere to the stated thresholds to maintain the minimum guaranteed flow requirements.*

<table>
<thead>
<tr>
<th>Month</th>
<th>Median monthly flow (cfs)</th>
<th>Threshold (+ pump)</th>
<th>Estimated Available water (cfs)</th>
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</thead>
<tbody>
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</tbody>
</table>

### Water Availability Assessment of Location

- **Base Threshold (cfs):** -
- **Upstream Demand (cfs):** 24.29
- **Downstream Demand (cfs):** 0.00
- **Pump rate (cfs):** 4.46
- **Headwater Safety (cfs):** 0.00
- **Ungauged Stream Safety (cfs):** 0.00
- **Min. Gauge Reading (cfs):** -
- **Passby at Location (cfs):** -
Source Detail

WMP: 01413  API/ID Number: 047-017-06318  Operator: Antero Resources

Olivia Unit 2H

Source ID: 24504  Source Name: West Fork River @ McDonald Withdrawal
David Shriwees

HUC-8 Code: 5020002

Drainage Area (sq. mi.): 314.91  County: Harrison

Endangered Species?  Mussel Stream?
Trout Stream?  Tier 3?
Regulated Stream?  Stonewall Jackson Dam
Proximate PSD?
Gauged Stream?

Anticipated withdrawal start date: 1/13/2014
Anticipated withdrawal end date: 1/13/2015
Total Volume from Source (gal): 7,570,000
Max. Pump rate (gpm): 3,000
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm): 0

Reference Gaug 3061000  WEST FORK RIVER AT ENTERPRISE, WV
Drainage Area (sq. mi.) 759.00  Gauge Threshold (cfs): 234

Water Availability Profile

Flow on this stream is regulated by the Army Corps of Engineers. Please adhere to the stated thresholds to maintain the minimum guaranteed flow requirements.

Median Monthly Flow (cfs)

<table>
<thead>
<tr>
<th>Month</th>
<th>Median monthly flow (+ pump)</th>
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</thead>
<tbody>
<tr>
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<td>12</td>
<td>744.28</td>
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</table>

Threshold Available water (cfs)

Water Availability Assessment of Location

Base Threshold (cfs): -
Upstream Demand (cfs): 24.29
Downstream Demand (cfs): 0.00
Pump rate (cfs): 6.68
Headwater Safety (cfs): 24.27
Ungauged Stream Safety (cfs): 0.00

Min. Gauge Reading (cfs): -
Passby at Location (cfs): -

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.
**Source Detail**

**WMP:** 01413  
**API/ID Number:** 047-017-06318  
**Operator:** Antero Resources

Olivia Unit 2H

**Source ID:** 24505  
**Source Name:** West Fork River @ GAL Withdrawal  
David Shrieves

**HUC-8 Code:** 5020002  
**Drainage Area (sq. mi.):** 313.67  
**County:** Harrison

- **Endangered Species?**  
- **Trout Stream?**  
- **Regulated Stream?**  
- **Proximate PSD?**  
**Gauged Stream?**

**Source Latitude:** 39.16422  
**Source Longitude:** -80.45173

**Anticipated withdrawal start date:** 1/13/2014  
**Anticipated withdrawal end date:** 1/13/2015  
**Total Volume from Source (gal):** 7,570,000

**Max. Pump rate (gpm):** 2,000

- **Max. Simultaneous Trucks:** 0  
- **Max. Truck pump rate (gpm):** 0

**Reference Gaug**  
**Gauge Threshold (cfs):** 234

**Drainage Area (sq. mi.)**  
**Gauge Threshold (cfs):**

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<tr>
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<th>Threshold (+ pump)</th>
<th>Estimated Available water (cfs)</th>
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<td>12</td>
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**Water Availability Assessment of Location**

- **Base Threshold (cfs):** -
- **Upstream Demand (cfs):** 24.29
- **Downstream Demand (cfs):** 0.00
- **Pump rate (cfs):** 4.46
- **Headwater Safety (cfs):** 24.18
- **Ungauged Stream Safety (cfs):** 0.00

- **Min. Gauge Reading (cfs):** -
- **Passby at Location (cfs):** -

---

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

*Flow on this stream is regulated by the Army Corps of Engineers. Please adhere to the stated thresholds to maintain the minimum guaranteed flow requirements."
Source Detail

Source ID: 24506  Source Name: Middle Island Creek @ Mees Withdrawal Site
Source Latitude: 39.43113
Source Longitude: -81.079567

Endangered Species? ☑  Mussel Stream? ☑  Trout Stream?  ☐
Regulated Stream?  ☐  Proximate PSD?  ☐  Gauged Stream?  ☑

Deaths Code: 5030201  County: Pleasants

Anticipated withdrawal start date: 1/13/2014
Anticipated withdrawal end date: 1/13/2015
Total Volume from Source (gal): 7,570,000
Max. Pump rate (gpm): 3,360
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm): 0

Reference Gaug
Drainage Area (sq. mi.): 458.00
Gauge Threshold (cfs): 45

Month | Median monthly flow (cfs) | Threshold (+ pump) | Estimated Available water (cfs)
--- | --- | --- | ---
1 | 519.88 | 55.12 | 465.14
2 | 653.95 | 55.12 | 599.22
3 | 731.75 | 55.12 | 677.01
4 | 543.38 | 55.12 | 488.65
5 | 286.64 | 55.12 | 231.90
6 | 100.10 | 55.12 | 45.36
7 | 56.65 | 55.12 | 1.91
8 | 46.64 | 55.12 | -8.10
9 | 23.89 | 55.12 | -30.85
10 | 30.01 | 55.12 | -24.72
11 | 146.56 | 55.12 | 91.83
12 | 358.10 | 55.12 | 303.37

Water Availability Profile

Water Availability Assessment of Location

Base Threshold (cfs): 47.63
Upstream Demand (cfs): 0.00
Downstream Demand (cfs): 0.00
Pump rate (cfs): 7.49
Headwater Safety (cfs): 0.00
Ungauged Stream Safety (cfs): 0.00
Min. Gauge Reading (cfs): 52.49
Passby at Location (cfs): 47.63

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

09/27/2013

West Virginia Department of Environmental Protection

9/23/2013 11:07:57 AM
Source ID: 24507  Source Name: Middle Island Creek @ Dawson Withdrawal
Gary D. and Rella A. Dawson

HUC-8 Code: 5030201  Drainage Area (sq. mi.): 181.34  County: Tyler

- Endangered Species? ✓  Mussel Stream?
- Trout Stream?
- Regulated Stream?
- Proximate PSD?
✓ Gauged Stream?

Source Latitude: 39.379292  Source Longitude: -80.867803

Anticipated withdrawal start date: 1/13/2014  Anticipated withdrawal end date: 1/13/2015
Total Volume from Source (gal): 7,570,000
Max. Pump rate (gpm): 3,000
Max. Simultaneous Trucks: 0  Max. Truck pump rate (gpm): 0

Reference Gaug 3114500  MIDDLE ISLAND CREEK AT LITTLE, WV
Drainage Area (sq. mi.) 458.00  Gauge Threshold (cfs): 45

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<th>Month</th>
<th>Median monthly flow (+ pump) (cfs)</th>
<th>Estimated Available water (cfs)</th>
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<tr>
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<td>54.82</td>
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<tr>
<td>12</td>
<td>133.96</td>
<td>92.17</td>
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</tbody>
</table>

Water Availability Profile

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Water Availability Assessment of Location

- Base Threshold (cfs): 17.82
- Upstream Demand (cfs): 13.10
- Downstream Demand (cfs): 6.55
- Pump rate (cfs): 6.68
- Headwater Safety (cfs): 4.45
- Ungauged Stream Safety (cfs): 0.00

Min. Gauge Reading (cfs): 76.03  Passby at Location (cfs): 28.82

09/27/2013
Source Detail

Source ID: 24508  Source Name: McElroy Creek @ Forest Withdrawal Forest C. & Brenda L. Moore

HUC-8 Code: 5030201  Drainage Area (sq. mi.): 88.85  County: Tyler

- Endangered Species?
- Mussel Stream?
- Trout Stream?
- Regulated Stream?
- Proximate PSD?
- Gauged Stream?

Source Latitude: 39.39675  Source Longitude: -80.738197

Anticipated withdrawal start date: 1/13/2014  Anticipated withdrawal end date: 1/13/2015

Total Volume from Source (gal): 7,570,000

Max. Pump rate (gpm): 1,000  Max. Simultaneous Trucks: 0  Max. Truck pump rate (gpm): 0

Reference Gauge: 3114500  Drainage Area (sq. mi.): 458.00  Gauge Threshold (cfs): 45

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<thead>
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<th>Month</th>
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</thead>
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<td>12</td>
<td>65.63 19.78</td>
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Water Availability Profile

Water Availability Assessment of Location

- Base Threshold (cfs): 8.73
- Upstream Demand (cfs): 4.46
- Downstream Demand (cfs): 0.00
- Pump rate (cfs): 2.23
- Headwater Safety (cfs): 2.18
- Ungauged Stream Safety (cfs): 2.18

Min. Gauge Reading (cfs): 74.19  Passby at Location (cfs): 13.09

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.
Source Detail

WMP: 01413  API/ID Number: 047-017-06318  Operator: Antero Resources

Olivia Unit 2H

Source ID: 24509  Source Name: Meathouse Fork @ Gagnon Withdrawal
George L. Gagnon and Susan C. Gagnon

HUC-8 Code: 5030201  Drainage Area (sq. mi.): 60.6  County: Doddridge

Endangered Species? ☑  Mussel Stream? ☑
Trout Stream?  Tier 3?
Regulated Stream?  Proximate PSD?
Gauged Stream?

Source Latitude: 39.26054  Source Longitude: -80.720998

Anticipated withdrawal start date: 1/13/2014  Anticipated withdrawal end date: 1/13/2015
Total Volume from Source (gal): 7,570,000
Max. Pump rate (gpm): 1,000
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm): 0

Reference Gaug 3114500  MIDDLE ISLAND CREEK AT LITTLE, WV
Drainage Area (sq. mi.) 458.00  Gauge Threshold (cfs): 45

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<tr>
<th>Month</th>
<th>Median monthly flow (+ pump) (cfs)</th>
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Water Availability Profile

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Water Availability Assessment of Location

Base Threshold (cfs): 5.95
Upstream Demand (cfs): 2.23
Downstream Demand (cfs): 2.81
Pump rate (cfs): 2.23
Headwater Safety (cfs): 1.49
Ungauged Stream Safety (cfs): 1.49

Min. Gauge Reading (cfs): 71.96
Passby at Location (cfs): 11.74

09/27/2013

west virginia department of environmental protection

9/23/2013 11:07:58 AM
**Source Detail**

**WMP:** 01413  
**API/ID Number:** 047-017-06318  
**Operator:** Antero Resources

**Source ID:** 24510  
**Source Name:** Meathouse Fork @ Whitehair Withdrawal Elton Whitehair

**HUC-8 Code:** 5030201  
**Drainage Area (sq. mi.):** 30.37  
**County:** Dodridge

- Endangered Species?  
- Mussel Stream?  
- Trout Stream?  
- Regulated Stream?  
- Proximate PSD?  
- Gauged Stream?

**Source Latitude:** 39.211317  
**Source Longitude:** -80.679592

**Anticipated withdrawal start date:** 1/13/2014  
**Anticipated withdrawal end date:** 1/13/2015  
**Total Volume from Source (gal):** 7,570,000

**Max. Pump rate (gpm):** 1,000

- Max. Simultaneous Trucks: 0
- Max. Truck pump rate (gpm): 0

**Reference Gaug**  
**Gauge Threshold (cfs):** 45

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<td>22.43</td>
<td>6.70</td>
<td>16.01</td>
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**Water Availability Assessment of Location**

- **Base Threshold (cfs):** 2.98
- **Upstream Demand (cfs):** 0.00
- **Downstream Demand (cfs):** 2.81
- **Pump rate (cfs):** 2.23
- **Headwater Safety (cfs):** 0.75
- **Ungauged Stream Safety (cfs):** 0.75

- **Min. Gauge Reading (cfs):** 69.73
- **Passby at Location (cfs):** 7.29

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

**09/27/2013**

*west virginia department of environmental protection*

9/23/2013 11:07:58 AM
**Source Detail**

<table>
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<th>Tom’s Fork @ Erwin Withdrawal</th>
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<td></td>
<td></td>
<td></td>
<td>John F. Erwin and Sandra E. Erwin</td>
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<td>County:</td>
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<td>Trout Stream?</td>
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<td>Tier 3?</td>
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<tr>
<td>Regulated Stream?</td>
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<td>Proximate PSD?</td>
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<tr>
<td>Total Volume from Source (gal):</td>
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<td>Max. Pump rate (gpm):</td>
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**Reference Gaug**

| Drainage Area (sq. mi.) | 458.00 | Gauge Threshold (cfs): | 45 |

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**Water Availability Profile**

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

**Water Availability Assessment of Location**

| Base Threshold (cfs): | 0.39 |
| Upstream Demand (cfs): | 0.00 |
| Downstream Demand (cfs): | 0.00 |
| Pump rate (cfs): | 2.23 |
| Headwater Safety (cfs): | 0.10 |
| Ungauged Stream Safety (cfs): | 0.10 |
| Min. Gauge Reading (cfs): | 69.73 |
| Passby at Location (cfs): | 0.59 |

09/27/2013

west virginia department of environmental protection

9/23/2013 11:07:58 AM
Source ID: 24512  Source Name: Arnold Creek @ Davis Withdrawal Jonathon Davis

HUC-8 Code: 5030201  Drainage Area (sq. mi.): 20.83  County: Doddridge

- Endangered Species?
- Mussel Stream?
- Trout Stream?
- Regulated Stream?
- Proximate PSD?
- Gauged Stream?

Source Latitude: 39.302006  Source Longitude: -80.824561

Anticipated withdrawal start date: 1/13/2014  Anticipated withdrawal end date: 1/13/2015
Total Volume from Source (gal): 7,570,000
Max. Pump rate (gpm): 1,000
Max. Simultaneous Trucks: 0  Max. Truck pump rate (gpm): 0

Reference Gaug: 3114500  MIDDLE ISLAND CREEK AT LITTLE, WV
Gauge Threshold (cfs): 45

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<th>Threshold (+ pump) (cfs)</th>
<th>Estimated Available water (cfs)</th>
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<td>10.34</td>
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Water Availability Profile

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Water Availability Assessment of Location
- Base Threshold (cfs): 2.05
- Upstream Demand (cfs): 0.00
- Downstream Demand (cfs): 0.00
- Pump rate (cfs): 2.23
- Headwater Safety (cfs): 0.51
- Ungauged Stream Safety (cfs): 0.51
- Min. Gauge Reading (cfs): 69.73
- Passby at Location (cfs): 3.07

west virginia department of environmental protection

09/27/2013

9/23/2013 11:07:58 AM
Source ID: 24513  Source Name: Buckeye Creek @ Powell Withdrawal
Dennis Powell

HUC-8 Code: 5030201
Drainage Area (sq. mi.): 31.15  County: Doddridge

Anticipated withdrawal start date: 1/13/2014
Anticipated withdrawal end date: 1/13/2015
Total Volume from Source (gal): 7,570,000
Max. Pump rate (gpm): 1,000
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm): 0

Reference Gaug 3114500  MIDDLE ISLAND CREEK AT LITTLE, WV
Drainage Area (sq. mi.) 458.00  Gauge Threshold (cfs): 45

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Water Availability Assessment of Location

Base Threshold (cfs): 3.06
Upstream Demand (cfs): 0.00
Downstream Demand (cfs): 0.00
Pump rate (cfs): 2.23
Headwater Safety (cfs): 0.77
Ungauged Stream Safety (cfs): 0.77
Min. Gauge Reading (cfs): 69.73
Passby at Location (cfs): 4.59

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

09/27/2013
Source Detail

Source ID: 24514  Source Name: South Fork of Hughes River @ Knight Withdrawal
Tracy C. Knight & Stephanie C. Knight

HUC-8 Code: 5030203  County: Ritchie
Drainage Area (sq. mi.): 16.26

Endangered Species? ☑  Mussel Stream?  ☑  Tier 3?
Trout Stream?
Regulated Stream?
Proximate PSD?
Gauged Stream?

Source Latitude: 39.198369  Source Longitude: -80.870969

Anticipated withdrawal start date: 1/13/2014  Anticipated withdrawal end date: 1/13/2015
Total Volume from Source (gal): 7,570,000
Max. Pump rate (gpm): 3,000
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm): 0

Reference Gaug 3155220  SOUTH FORK HUGHES RIVER BELOW MACFARLAN, WV
Drainage Area (sq. mi.) 229.00  Gauge Threshold (cfs): 22

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<th>Month</th>
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<tr>
<td>3</td>
<td>65.21 14.26</td>
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<td>32.06 14.26</td>
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Water Availability Assessment of Location

Base Threshold (cfs): 1.56
Upstream Demand (cfs): 5.62
Downstream Demand (cfs): 0.00
Pump rate (cfs): 6.68
Headwater Safety (cfs): 0.39
Ungauged Stream Safety (cfs): 0.00

Min. Gauge Reading (cfs): 39.80
Passby at Location (cfs): 1.95

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

09/27/2013
west virginia department of environmental protection
9/23/2013 11:07:59 AM
Source Detail

Source ID: 24515  Source Name: North Fork of Hughes River @ Davis Withdrawal
Lewis P. Davis and Norma J. Davis

HUC-8 Code: 5030203  Drainage Area (sq. mi.): 15.18  County: Ritchie

- Endangered Species?  [✓] Mussel Stream?
- Trout Stream?
- Regulated Stream?
- Proximate PSD?
- Gauged Stream?

Source Latitude: 39.322363  Source Longitude: -80.936771

Anticipated withdrawal start date: 1/13/2014  Anticipated withdrawal end date: 1/13/2015
Total Volume from Source (gal): 7,570,000
Max. Pump rate (gpm): 1.000

Max. Simultaneous Trucks: 0  Max. Truck pump rate (gpm): 0

Reference Gaug 3155220  SOUTH FORK HUGHES RIVER BELOW MACFARLAN, WV
Drainage Area (sq. mi.) 229.00  Gauge Threshold (cfs): 22

<table>
<thead>
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<th>Month</th>
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<td>4.42</td>
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Water Availability Profile

**Water Availability Assessment of Location**

- Base Threshold (cfs): 1.46
- Upstream Demand (cfs): 0.00
- Downstream Demand (cfs): 0.00
- Pump rate (cfs): 2.23
- Headwater Safety (cfs): 0.36
- Ungauged Stream Safety (cfs): 0.36

Min. Gauge Reading (cfs): 35.23  Passby at Location (cfs): 2.19

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

09/27/2013

west virginia department of environmental protection

9/23/2013 11:07:59 AM
Important:

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

• For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.

• For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

Lake/Reservoir

Source ID: 24520  Source Name: City of Salem Reservoir (Lower Dog Run) Public Water Provider
Source Lat: 39.28834  Source Long: -80.54966  Source start date: 1/13/2014  Source end date: 1/13/2015
County: Harrison  Max. Daily Purchase (gal): 1,000,000  Total Volume from Source (gal): 7,570,000

DEP Comments:
Important:

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

• For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.

• For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

---

Source ID: 24521  Source Name: Pennsboro Lake
Source Lat: 39.281689  Source Long: -80.925526  County: Ritchie
Max. Daily Purchase (gal): 7,570,000

Source start date: 1/13/2014  Source end date: 1/13/2015

DEP Comments:

---

Source ID: 24522  Source Name: Powers Lake (Wilderness Water Park Dam)
Private Owner
Source Lat: 39.255752  Source Long: -80.463262  County: Harrison
Max. Daily Purchase (gal): 7,570,000

Source start date: 1/13/2014  Source end date: 1/13/2015

DEP Comments:
Important:

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

- For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.

- For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

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<th>Source ID</th>
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DEP Comments:
Important:

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

• For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.

• For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

Other

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<td>Max. Daily Purchase (gal)</td>
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Important:

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

- For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.

- For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

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DEP Comments:

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DEP Comments:
Important:

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

• For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.

• For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

### Recycled Frac Water

- **Source ID:** 24529
- **Source Name:** McConnell Unit 1H
- **Source start date:** 1/13/2014
- **Source end date:** 1/13/2015
- **Source Lat:**
- **Source Long:**
- **County:**
- **Total Volume from Source (gal):** 7,570,000

DEP Comments: